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selection has resulted in a race of plants degenerate from the standpoint of their power to resist unfavorable conditions. In the fields, even under usual conditions, a large percentage of the plants wilt on hot days. The reduction of thickness of the leaf is held in large measure responsible for the occurrence of the mosaic disease. A lesser though important influence is also attributed to the direct action of the soils.—H. HASSELBRING.

Microsporangia of Pteridosperms.—In 1905 KIDSTON published a preliminary note on the occurrence of microsporangia in connection with the foliage of *Lyginodendron*.⁷ He has now published the full paper,⁸ with detailed discussion and illustration. He first elaborates the evidence that *Sphenopteris Höninghausi* Brongn. and *Lyginodendron Oldhamium* Williamson are identical plants, and of course *Crossothea Höninghausi* is the fertile pinnule of the former. It follows that the sporangia found on this species of *Crossothea* are the microsporangia of *Lyginodendron Oldhamium*, a well-known pteridosperm. This rules out Miss BENSON's claim that *Telangium Scotti* represents the microsporangia of this *Lyginodendron*.

The microsporangia are borne on modified pinnae, associated with sterile pinnae. The fertile pinna is oval, entire, on a short thick pedicel, and on the under side of the blade six to eight fusiform bilocular sporangia are borne, which bend inward at an early stage so that their pointed apices meet, forming a sort of hemispherical sorus. Later they spread apart and appear as a fringe hanging from the margin of the pinnule. In all cases the microspores are present, but no internal structure seems to be evident. The genus *Crossothea* contains eight species, a new one being described in this paper, and perhaps it is safe to assume that all of them belong to the pteridosperms.

In a general discussion of the occurrence of fern-like plants, KIDSTON comes to the conclusion that the pteridosperms (including all Cycadofilices) are undoubtedly the oldest group of fern-like plants of which we have evidence, being plainly represented in the upper Devonian; that in the Lower Carboniferous pteridosperms were still dominant, true ferns being feebly represented, if at all, by the Botryopterideae; that in the Upper Carboniferous the same relative representation continued. It seems highly improbable, therefore, that the pteridosperms could have descended from true ferns, and KIDSTON is inclined to believe that there is no more relationship between the two groups than that of a common ancestry for pteridosperms and eusporangiate ferns. In summing up his conception of the most probable lines of descent of the existing ferns and cycads, he indicates three lines: an independent one, leading from Botryopterideae (of unknown origin) to the leptosporangiate ferns, and two lines converging in common but unknown ancestral forms, one leading to the Marattiaceae, the other through pteridosperms to the cycads.—J. M. C.

⁷ BOT. GAZETTE 41:219. 1906.

⁸ KIDSTON, ROBERT, On the microsporangia of the Pteridospermae, with remarks on their relationships to existing groups. Phil. Trans. Roy. Soc. London B. 198:413-445. pls. 25-28. 1906.